

Summary of WRAP RMC BART Modeling for Utah

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More Information: <http://pah.cert.ucr.edu/aqm/308/bart.shtml>

This document summarizes the preliminary CALMET/CALPUFF BART modeling results performed by the WRAP RMC for Utah. The procedures used are outlined in the WRAP RMC BART Modeling Protocol that is available at:

http://pah.cert.ucr.edu/aqm/308/bart/WRAP_RMC_BART_Protocol_Aug15_2006.pdf

The basic assumptions in the WRAP BART CALMET/CALPUFF modeling are as follows:

- Use of three years of modeling of 2001, 2002 and 2003 (except Alaska where just one year, 2002, was used).
- Visibility impacts due to emissions of SO₂, NO_x and primary PM emissions were calculated (even for Section 309 States):
 - Unless States provided speciated PM emissions, all PM emissions were modeled as PM_{2.5}.
- Visibility was calculated using the Original IMPROVE equation and Annual Average Natural Conditions.

The tables that follow contain the following information for each Utah BART source unit and each Class I area that is within at least 300 km of the source:

- The first row contains the source number, name and SO₂ and NO_x emissions that were provided by the State.
- Each subsequent row has information on the visibility impacts at a Class I area, with the columns containing the following information for the indicated Class I area:
 1. The Class I area;
 2. The distance (km) between the source and the closest receptor in the Class I area (only Class I areas with at least one receptor 300 km or less are included in the tables);
 3. The 98th percentile (8th highest) visibility impacts in 2001;
 4. The 98th percentile (8th highest) visibility impacts in 2002;
 5. The 98th percentile (8th highest) visibility impacts in 2003; and
 6. The average of the 98th percentile across 2001, 2002 and 2003.

Figure 1 below shows the locations of the Hunter (labeled 1) and Huntington (labeled 2) sources in Utah and Class I areas in the modeling domain. The Hunter Units 1 and 2 and Huntington Units 1 and 2 sources are modeled using current emissions (SRC01 through SRC04) and future controlled emission levels (SRC05 through SRC08).

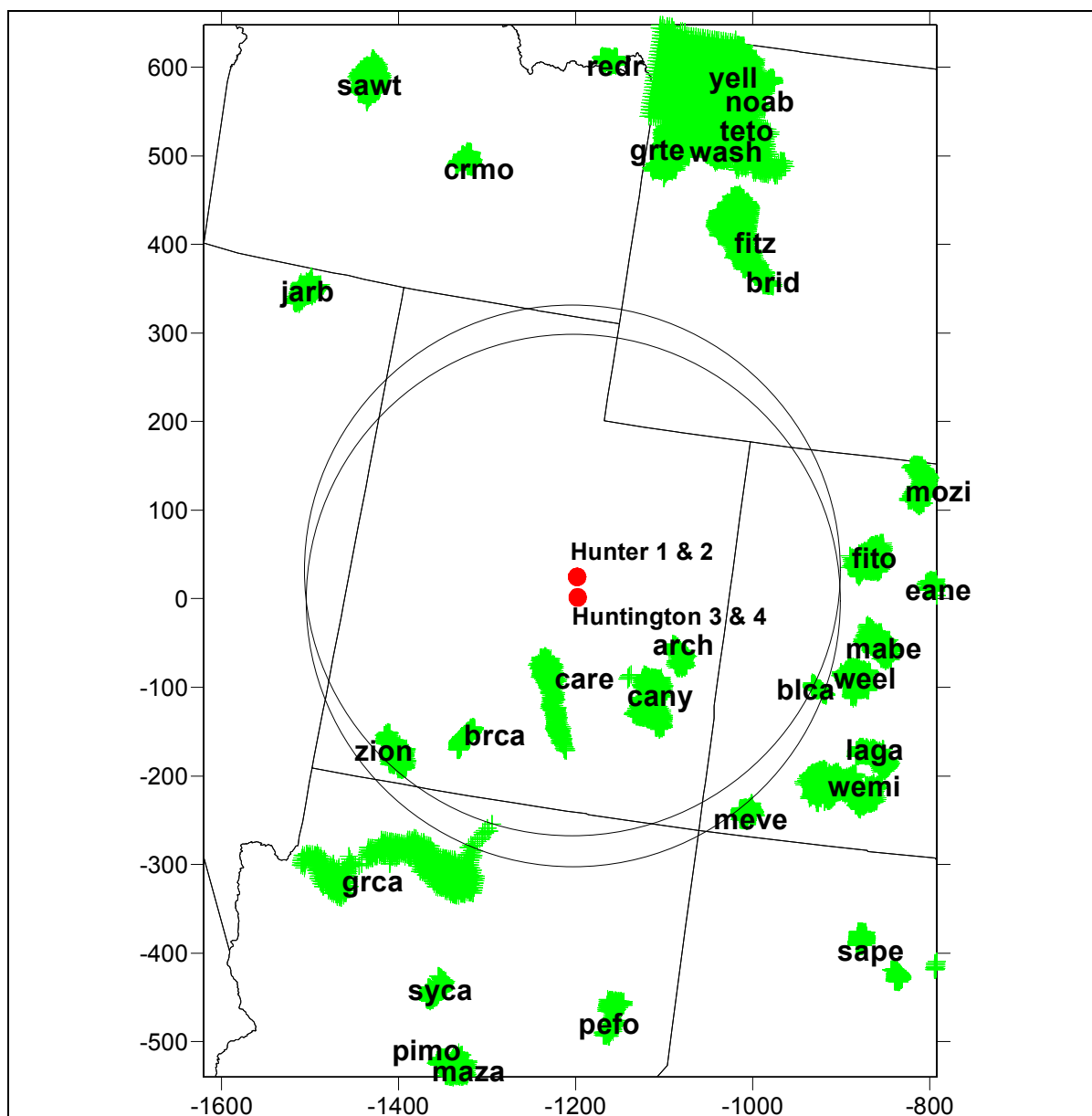


Figure 1. Relationship between Utah potential BART-eligible sources and Class I areas. Hunter Units 1 and 2 and Huntington Units 1 and 2 modeled separate using uncontrolled (SRC01-SRC04) and controlled (SRC05-SRC8) emissions.

Table 1. Hunter and Huntington Units 1 and 2 current and future controlled emission levels. Modeling was performed using same stack parameters in current and future conditions.

Current Plant Configurations

* = Calculated Based on Permit Limit

Actual Emissions * - 1 hour Values (lb/hr) for 2002-2003 24-hour Max. Emission Day

Plant	Unit	SO2	NOX	PM
Hunter (SRC01)	1	1402	2309	83.25
Hunter (SRC02)	2	1427	1924	83.25
Huntington (SRC03)	1	1555	1887	166.9
Huntington (SRC04)	2	5537	1912	76.1

Current Plant Stack Parameters

Plant	Unit	Stack Location (UTM)	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)
Hunter (SRC01)	1	497310/4335950	182.9	7.32	17.6
Hunter (SRC02)	2	497360/4335950	182.9	7.32	18.2
Huntington (SRC03)	1	493100/4358840	182.9	7.32	16.9
Huntington (SRC04)	2	493150/4358840	182.9	7.32	20.1

Future Configurations

Calculated 1-hr Emissions in lb/hr - Using Maximum Boiler Capacity and Proposed Permitted Emissions Limits

Changed emission rates to reflected "permitted" not "best expected" rates

Huntington 2 emission rates are listed in the AO for the Huntington 2 pollution control projects

Plant	Unit	SO2	NOX	PM
Hunter (SRC05)	1	199.8	432.9	24.975
Hunter (SRC06)	2	199.8	432.9	24.975
Huntington (SRC07)	1	203.90	441.79	70
Huntington (SRC08)	2	182.64	395.72	70
Permitted Rates (lb/mmBTU)		0.12	0.26	0.15
BACT Presumptive Rates		0.15	0.28	

UT SRC01 Current Hunter Unit #1: SO₂ = 6,141 TPY; NO_x = 10,113 TPY

Annual Average Natural Conditions

Class I Areas with at least 1 receptor within 300 km of source

	Minimum Distance	98th percentile for each year			98th
	(km)	2001	2002	2003	3 year AVG
Capitol Reef National Park	75	1.54	2.628	2.267	2.145
Canyonlands National Park	105	2.024	1.645	2.006	1.892
Arches National Park	119	1.741	1.42	1.769	1.643
Bryce Canyon National Park	187	0.63	0.685	0.313	0.543
Zion National Park	258	0.671	0.502	0.202	0.458
Grand Canyon National Park	273	0.537	0.792	0.425	0.585
Black Canyon of the Gunnison Wilderness Area	281	0.662	0.596	0.54	0.599
Mesa Verde National Park	300	0.645	0.513	0.439	0.532

UT SRC02 Current Hunter Unit #2: SO₂ = 6,250 TPY; NO_x = 8,427 TPY

Annual Average Natural Conditions

Class I Areas with at least 1 receptor within 300 km of source

	Minimum Distance	98th percentile for each year			98th
	(km)	2001	2002	2003	3 year AVG
Capitol Reef National Park	75	1.417	2.32	1.978	1.905
Canyonlands National Park	105	1.68	1.516	1.792	1.663
Arches National Park	119	1.499	1.295	1.544	1.446
Bryce Canyon National Park	187	0.529	0.591	0.269	0.463
Zion National Park	258	0.586	0.462	0.195	0.414
Grand Canyon National Park	273	0.474	0.702	0.368	0.515
Black Canyon of the Gunnison Wilderness Area	281	0.59	0.526	0.469	0.528
Mesa Verde National Park	300	0.565	0.445	0.382	0.464

UT SRC03 Current Huntington Unit #1: SO₂ = 6,811 TPY; NO_x = 8,265 TPY

Annual Average Natural Conditions

Class I Areas with at least 1 receptor within 300 km of source

	Minimum Distance	98th percentile for each year			98th
	(km)	2001	2002	2003	3 year AVG
Capitol Reef National Park	74	1.402	2.372	1.954	1.909
Canyonlands National Park	105	1.672	1.536	1.73	1.646
Arches National Park	119	1.506	1.244	1.61	1.453
Bryce Canyon National Park	186	0.517	0.602	0.275	0.465
Zion National Park	257	0.602	0.483	0.204	0.43
Grand Canyon National Park	272	0.487	0.723	0.396	0.535
Black Canyon of the Gunnison Wilderness Area	282	0.595	0.556	0.505	0.552
Mesa Verde National Park	300	0.567	0.46	0.403	0.477

UT SRC04 current Huntington Unit #2: SO₂ = 24,252 TPY; NO_x = 8375 TPY

Annual Average Natural Conditions

Class I Areas with at least 1 receptor within 300 km of source

	Minimum Distance	98th percentile for each year			98th
	(km)	2001	2002	2003	3 year AVG
Capitol Reef National Park	74	1.982	3.098	2.521	2.534
Canyonlands National Park	105	2.066	2.317	2.645	2.343
Arches National Park	119	1.741	1.952	2.295	1.996
Bryce Canyon National Park	186	0.979	1.138	0.602	0.906
Zion National Park	257	1.008	0.843	0.515	0.789
Grand Canyon National Park	272	0.95	1.299	0.762	1.004
Black Canyon of the Gunnison Wilderness Area	282	1.258	1.165	1.028	1.15
Mesa Verde National Park	300	1.119	0.812	0.811	0.914

UT SRC05 Controlled Hunter Unit #1: SO₂ = 875 TPY; NO_x = 1896 TPY

Annual Average Natural Conditions

Class I Areas with at least 1 receptor within 300 km of source

	Minimum Distance	98th percentile for each year			98th
	(km)	2001	2002	2003	3 year AVG
Capitol Reef National Park	75	0.014	0.023	0.02	0.019
Canyonlands National Park	105	0.017	0.015	0.018	0.017
Arches National Park	119	0.015	0.012	0.015	0.014
Bryce Canyon National Park	187	0.005	0.006	0.003	0.005
Zion National Park	258	0.005	0.004	0.002	0.004
Grand Canyon National Park	273	0.004	0.006	0.003	0.004
Black Canyon of the Gunnison Wilderness Area	281	0.005	0.005	0.004	0.005
Mesa Verde National Park	300	0.005	0.004	0.004	0.004

UT SRC06 Controlled Hunter Unit #2: SO₂ = 875 TPY; NO_x = 1896 TPY

Annual Average Natural Conditions

Class I Areas with at least 1 receptor within 300 km of source

	Minimum Distance	98th percentile for each year			98th
	(km)	2001	2002	2003	3 year AVG
Capitol Reef National Park	75	0.015	0.023	0.02	0.019
Canyonlands National Park	105	0.017	0.015	0.019	0.017
Arches National Park	119	0.015	0.012	0.015	0.014
Bryce Canyon National Park	187	0.005	0.006	0.003	0.005
Zion National Park	258	0.005	0.004	0.002	0.004
Grand Canyon National Park	273	0.004	0.006	0.003	0.004
Black Canyon of the Gunnison Wilderness Area	281	0.005	0.005	0.004	0.005
Mesa Verde National Park	300	0.005	0.004	0.004	0.004

UT SRC07 Controlled Huntington Unit #1: SO₂ = 893 TPY; NO_x = 1935 TPY
Annual Average Natural Conditions
Class I Areas with at least 1 receptor within 300 km of source

	Minimum Distance	98th percentile for each year			98th
	(km)	2001	2002	2003	3 year AVG
Capitol Reef National Park	74	0.015	0.023	0.02	0.019
Canyonlands National Park	105	0.016	0.015	0.019	0.017
Arches National Park	119	0.015	0.011	0.015	0.014
Bryce Canyon National Park	186	0.006	0.006	0.003	0.005
Zion National Park	257	0.005	0.004	0.002	0.004
Grand Canyon National Park	272	0.004	0.006	0.003	0.004
Black Canyon of the Gunnison Wilderness Area	282	0.005	0.005	0.004	0.005
Mesa Verde National Park	300	0.005	0.004	0.004	0.004

UT SRC08 Controlled Huntington Unit #2: SO₂ = 800 TPY; NO_x = 1,733 TPY
Annual Average Natural Conditions
Class I Areas with at least 1 receptor within 300 km of source

	Minimum Distance	98th percentile for each year			98th
	(km)	2001	2002	2003	3 year AVG
Capitol Reef National Park	74	0.011	0.019	0.016	0.015
Canyonlands National Park	105	0.012	0.011	0.014	0.012
Arches National Park	119	0.009	0.009	0.009	0.009
Bryce Canyon National Park	186	0.005	0.005	0.002	0.004
Zion National Park	257	0.005	0.004	0.002	0.004
Grand Canyon National Park	272	0.004	0.006	0.002	0.004
Black Canyon of the Gunnison Wilderness Area	282	0.005	0.004	0.004	0.004
Mesa Verde National Park	300	0.005	0.004	0.003	0.004